Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

## STATEMENT OF SUBSTANCE OF INTERVIEW

As a preliminary matter, Applicant's representatives would like to thank Examiner

Satish Rampuria, and Supervisory Patent Examiner Anil Khatri, for courtesies extended in

the telephonic interview conducted on March 28, 2006.

Applicant submits this Statement to comply with the requirements of M.P.E.P. §

713.04. The telephonic interview included the following participants: Satish Rampuria, Anil

Khatri, Roch G. Archambault, James N. Dresser, and John J. Dresch.

In the interview, the following was discussed:

**A.    Identification of claims discussed:**

Claims 1-18.


**B.    Identification of prior art discussed:**

Sreedhar, et al. (U.S. Patent No. 6,182,284)

Sastry (U.S. Patent Publication No. 2002/0166115)


**C.    Identification of principal proposed amendments:**

To speed prosecution, and to define more clearly and particularly the features of the

claims, Applicant proposed amending the claims to recite "*interprocedural global variables*".

11

Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

For the Examiner's convenience, Applicant's explanation and reasoning for this amendment

is set forth below in the Remarks.

**D.    Brief Identification of principal arguments:**

In the interview, inventor Roch G. Archambault provided a detailed explanation of the

claimed invention and the cited references, as well as a detailed comparison of the clear

differences between the claimed invention and the cited references.

A summary of the explanation and arguments presented in the interview is provided

below in the Remarks, for the Examiner's convenience.

**E.    Results of the Interview:**

The Examiner kindly <u>agreed</u> that the proposed amendments to the claims to recite

"*interprocedural global variables*" would overcome the rejections based on Sreedhar, Sastry,

and Van Dyke.

However, the Examiner stated that an updated search and further consideration would

be necessary prior to determining the allowability of the claims.

12

Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

## REMARKS

Claims 1-18 remain pending in this application. By the above amendments, claims 1-3, 5, 7, 9, 10, 12, and 14 have been amended to more particularly define the invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and <u>not</u> for distinguishing the invention over the prior art, or narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-7, 9, and 11-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sreedhar, et al., U.S. Patent No. 6,182,284 B1 in view of Sastry, United States Patent Publication No. 2002/0166115 A1.

Claims 8, 10, 17, and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sreedhar in view of Sastry, and further in view of Van Dyke, United States Patent No. 5,175,856.

These rejections are respectfully <u>traversed</u> below.

In one aspect, the claimed invention is directed to a method for determining the correctness of a potential <u>interprocedural</u> dead store optimization for an optimizing compiler. In another aspect, the claimed invention is directed to a computer program product for the compilation of computer code. In a further aspect, the claimed invention is directed to an

13

Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

optimizing compiler. In yet another aspect, the claimed invention is directed to a component

for determining the correctness of a potential interprocedural dead store optimization for an

optimizing compiler.

To summarize, in the telephonic interview, Applicant explained for the Examiner that

a call graph is a diagram that identifies modules in a system or computer program and shows

which modules call one another. These modules are procedures. Thus, a call graph shows

the relationship between procedures; i.e., INTERprocedural relationships.

A control flow graph is a diagrammatic representation of the possible alternative

control flow paths through a component, or an abstract representation of a procedure. Thus,

a control flow graph shows the relationships within a procedure; i.e., INTRAprocedural

relationships.

In contrast to the cited references, the claimed invention relates to INTERprocedural

optimization. Each aspect of the claimed invention is directed to interprocedural dead store

optimization, which deals with analysis ACROSS procedures. The invention involves a call

graph, which shows the relationship between procedures. The invention involves

determining a live on exit set of variables for procedures, and determining a live on exit set of

variables for procedure call points. Thus, these are interprocedural global variables.

Sreedhar relates to INTRAprocedural optimization, which deals with analysis

WITHIN a procedure. Sreedhar analyzes sets of variables that are live at the beginning and

14

Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

end of basic blocks. See Sreedhar at column 2, lines 57-63. Thus, these are variables <u>within</u> a procedure. Thus, Sreedhar is concerned with <u>control flow graphs</u> and <u>local</u> variables.

Sastry is likewise concerned with <u>control flow</u> graphs. See Sastry at page 2, paragraph [0012], page 5, paragraph [0055], and page 8, paragraph [0112].

It is noted that, in the present Office Action, the Examiner relies on Sastry at page 5, paragraph [0055] and page 8, paragraph [0112] for disclosing "global variables". However, in the interview, the inventor explained and clarified for the Examiner that Sastry merely describes that the variable is tagged with the singleton resource (i.e., location in memory). That is, each global variable is associated with a memory resource. The memory resources are converted to SSA form in order to treat them uniformly with register resources and apply optimizations. However, the "global variables" in the context of the invention described in Sastry are relative to INTRAprocedural optimization. Indeed, page 8, paragraph [0112] of Sastry describes the number of loads and stores before and after the register promotion phase.

Hence, Sastry, like Sreedhar, relates to INTRAprocedural optimization.

Applicant gratefully acknowledges that, in the interview, the Examiner <u>agreed</u> that paragraphs [055] and [0112] of Sastry do <u>not</u> teach or suggest INTERprocedural optimization, as currently recited in the claims, but instead, teach INTRAprocedural optimization.

A person skilled in the art, after reviewing Sreedhar, Sastry, and Van Dyke, would <u>not</u> find it obvious to go from live on exit from basic blocks, as in Sreedhar, to live on exit from

15

Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

procedures, as in the claimed invention. Sreedhar's INTRAprocedural optimization requires

checking only <u>within</u> a <u>single procedure</u> for a <u>local</u> variable.

The claimed invention, on the other hand, involves INTERprocedural optimization,

and so involves <u>interprocedural global</u> variables. <u>All</u> locations within the <u>program</u> from

which the procedure is called must be determined. Further, this must be done in a <u>top down</u>

<u>fashion</u>. <u>All</u> call points must be checked.

Sreedhar, Sastry, and Van Dyke each relate to <u>INTRAprocedural</u> optimization. Thus,

even if combined, they would still relate only to <u>INTRAprocedural</u> optimization, and so

would <u>not</u> suggest the claimed invention.

The above similarly was argued in the Amendment under 37 C.F.R. §1.116 filed

August 16, 2005 in response to the Final Rejection, and the Preliminary Amendment under

37 C.F.R. § 1.114 filed October 12 ,2005 in response to the Advisory Action mailed

September 9, 2005, each of which is incorporated herein by reference in its entirety for the

Examiner's convenience.

Although the Amendment argues that the invention involves "interprocedural global

variables", while the references involve intraprocedural "local" variables, an "interprocedural

global variables" limitation was not explicitly found in the claims.

However, Applicant notes that the preamble of the claims (e.g., see claim 1)

previously did recite "*determining the correctness of a potential interprocedural dead store*

16

Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

*optimization for an optimizing compiler*". Also, the last recitation of claim 1 previously

recited using the determined live on exit set of global variables for the reached procedure

definition to determine global variables that are ineligible "*for interprocedural dead store*

*elimination in the reached procedure definition*".

To define more clearly the features of the invention, the claims have now been

amended to recite "*interprocedural global variables*", in accordance with the previously

presented preamble and last recitation of, for example, claim 1.

It is respectfully submitted that the "interprocedural" global limitation was inherent in

the claims prior to the above amendments. As set forth above, the claimed invention deals

with analysis ACROSS procedures and involves a call graph, which shows the relationship

between procedures. The invention involves determining a live on exit set of variables for

procedures, and determining a live on exit set of variables for procedure call points.

Inherently, these are interprocedural global variables.

In contrast, the references relate to INTRAprocedural optimization, with control flow

graphs and local variables.

To assure that this is apparent, the independent claims have been amended to

explicitly state that the variables are "*interprocedural global*" variables. In view of the

inherent inclusion of this limitation prior to the above amendments, the amendments do not

alter the scope of the claims. Further, that the variables are interprocedural global variables

17

Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

is brought out in numerous places in the specification, for example, see specification at page

10, lines 11-23.

As stated, the references relate to intraprocedural local variables and do not teach or

suggest the claimed invention. It is accordingly submitted that the claims distinguish from

the references in an unobvious manner and are allowable.

In the interview, the Examiner agreed that all of the features of the claims, as

currently amended, are not disclosed or suggested by Sreedhar, Sastry, and Van Dyke, either

individually or in combination. However, the Examiner stated that an updated search and

further consideration would be necessary prior to determining the allowability of the claims.

## CONCLUSION

In view of the foregoing, Applicant submits that claims 1-18, all the claims presently

pending in the application, are patentably distinct over the prior art of record and are

allowable, and that the application is in condition for allowance.

Should the Examiner find the application to be other than in condition for allowance,

the Examiner is requested to contact the undersigned attorney at the local telephone number

listed below to discuss any other changes deemed necessary in a telephonic or personal

interview.

18

Serial No. 09/965,521
Docket No. CA9-2000-0027US1
YOR.564

To the extent necessary, Applicant petitions for an extension of time under 37 C.F.R.

§ 1.136. Please charge any shortage in the fees due in connection with the filing of this

paper, including extension of time fees, to Attorney's Deposit Account No. 50-0510 and

please credit any excess fees to such deposit account.

Respectfully Submitted,

Date: _MARCH 28, 2006_          _____  Reg. No. 46,672
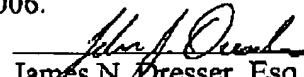                                James N. Dresser, Esq.
                                Registration No. 22,973

                                John J. Dresch, Esq.
                                Registration No. 46,672

**MCGINN INTELLECTUAL PROPERTY**
   **LAW GROUP, PLLC**
8321 Old Courthouse Road, Suite 200
Vienna, Virginia 22182-3817
(703) 761-4100
**Customer No. 21254**

### CERTIFICATE OF TRANSMISSION

I certify that I transmitted via facsimile to (571) 273-8300 the enclosed Amendment
under 37 C.F.R. § 1.111 and Statement of Substance of Interview to Examiner Satish
Rampuria, Art Unit 2191, on March 28, 2006.          _____  Reg. No. 46,672
                                James N. Dresser, Esq.
                                Registration No. 22,973

                                John J. Dresch, Esq.
                                Registration No. 46,672

19